**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

Claim 1 (currently amended): A communicating apparatus which makes spreading by multiplying transmission data by a chaos spreading code and transmits a spreading output, the communicating apparatus comprising:

first and second spreading units; and

a transmitting unit to which output signals of said first and second spreading units are inputted, wherein a first chaos spreading code which is inputted to said first spreading unit and a second chaos spreading code which is inputted to said second spreading unit orthogonally cross each other, wherein that is, an absolute value of a normalized correlation coefficient of said first and second chaos spreading codes is equal to or less than 0.3.

Claim 2 (currently amended): The A-communicating apparatus of according to claim 1, wherein a sum of squares of amplitude values of said first and second chaos spreading codes is constant.

Claim 3 (currently amended): The A-communicating apparatus of according to claim 1, wherein

said first and second chaos spreading codes are formed by a chaos spreading code generator comprising:

a storing unit in which an initial value is set;

a mapping unit for executing mapping once in which a map according to a Chebyshev's polynomial has been applied to the value that is outputted from said storing unit or for divisionally executing said mapping a plurality of number of times;

randomizing means for randomizing a least significant bit of an output of said mapping unit; and

a path for outputting the output of said mapping unit including said randomized least significant bit, as said chaos spreading code, and returning said output to said storing unit, and said initial value is made different between said first and second chaos spreading codes.

Claim 4 (currently amended): The ~~A code division multiple access~~ communicating apparatus of ~~according to~~ claim 1, wherein a user is identified by said first and second chaos spreading codes.

Claim 5 (currently amended): The ~~A~~ communicating apparatus of ~~according to~~ claim 1, wherein said transmitting unit is a radio transmitting unit for:

(a)     adding the output signals of said first and second spreading units~~;~~

(b)     up-converting an addition output into a predetermined carrier frequency~~;~~ and

(c)     transmitting an up-converted output from an antenna.

Claim 6 (currently amended): The ~~A~~ communicating apparatus of ~~according to~~ claim 1, wherein said transmitting unit is a radio transmitting unit for:

(a)     up-converting each of the output signals of said first and second spreading units into carriers which have predetermined frequencies and orthogonally cross each other~~; and~~

(b)     adding up-converted outputs; and

(c)     transmitting an addition output from an antenna.

Claim 7 (currently amended): A communicating method which makes spreading by multiplying transmission data by a chaos spreading code and transmits a spreading output, the communicating method comprising: ~~the steps of:~~

spreading the transmission data by first and second chaos spreading codes, respectively, and forming first and second spreading outputs; and

transmitting said first and second spreading outputs, wherein said first chaos spreading code and said second chaos spreading code orthogonally cross each other, wherein ~~that is,~~ an absolute value of a normalized correlation coefficient of said first and second chaos spreading codes is equal to or less than 0.3.

Claim 8 (currently amended): The communicating ~~A~~ method of ~~according to~~ claim 7, wherein a sum of squares of amplitude values of said first and second chaos spreading codes is constant.

Claim 9 (currently amended): The communicating ~~A~~ method of ~~according to~~ claim 7, wherein said first and second chaos spreading codes are formed by a chaos spreading code generating method comprising: ~~the steps of:~~

setting an initial value into a storing unit;

executing mapping once in which a map according to a Chebyshev's polynomial has been applied to the value that is outputted from said storing unit or divisionally executing said mapping a plurality of number of times;

randomizing a least significant bit of a mapping output; and

outputting the mapping output including said randomized least significant bit, as said chaos spreading code, and returning said output to said storing unit, and said initial value is made different between said first and second chaos spreading codes.

Claim 10 (currently amended): The ~~A code division multiple access~~ communicating method of ~~according to~~ claim 7, wherein a user is identified by said first and second chaos spreading codes.

Claim 11 (currently amended): The ~~A~~ communicating method of ~~according to~~ claim 7, further comprising: ~~the steps of:~~

adding said first and second spreading outputs;

up-converting an addition output into a predetermined carrier frequency; and

transmitting an up-converted output from an antenna.


Claim 12 (currently amended): The ~~A~~ communicating method of ~~according to~~ claim 7, further comprising the steps of:

up-converting each of output signals of said first and second spreading units into carriers which have predetermined frequencies and orthogonally cross each other; and

adding up-converted outputs and transmitting an addition output from an antenna.


Claim 13 (currently amended): A communicating apparatus for receiving transmission data constructed by first and second spreading outputs which have been spread by first and second chaos spreading codes, in which said first and second chaos spreading codes orthogonally cross each other, wherein ~~that is,~~ an absolute value of a normalized correlation coefficient of said first and second chaos spreading codes is equal to or less than 0.3, the communicating apparatus comprising:

a receiving unit for receiving said first and second spreading outputs;

first and second inverse spreading units for inversely spreading said first and second spreading outputs received by said receiving unit by said first and second chaos spreading codes, respectively; and

synchronizing means for synchronizing said first and second chaos spreading codes with a transmitting side.


Claim 14 (currently amended): The ~~A~~ communicating apparatus of ~~according to~~ claim 13, wherein a sum of squares of amplitude values of said first and second chaos spreading codes is constant.

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Claim 15 (currently amended): The ~~A~~ communicating apparatus of ~~according to~~ claim 13, wherein

said first and second chaos spreading codes are formed by a chaos spreading code generator comprising:

a storing unit in which an initial value is set;

a mapping unit for executing mapping once in which a map according to a Chebyshev's polynomial has been applied to the value that is outputted from said storing unit or for divisionally executing said mapping a plurality of number of times;

randomizing means for randomizing a least significant bit of an output of said mapping unit; and

a path for outputting the output of said mapping unit including said randomized least significant bit, as said chaos spreading code, and returning said output to said storing unit, and said initial value is made different between said first and second chaos spreading codes.


Claim 16 (currently amended): The ~~A code division multiple access~~ communicating apparatus of ~~according to~~ claim 13, wherein a user is identified by said first and second chaos spreading codes.


Claim 17 (currently amended): The ~~A~~ communicating apparatus of ~~according to~~ claim 13, wherein said receiving unit:

    (a)    has an antenna;~~,~~

    (b)    down-converts a reception signal of said antenna;~~,~~ and

    (c)    supplies the down-converted signal to said first and second inverse spreading units.

Claim 18 (currently amended): A communicating method of receiving transmission data constructed by first and second spreading outputs which have been spread by first and second chaos spreading codes, in which said first and second chaos spreading codes orthogonally cross each other, wherein ~~that is,~~ an absolute value of a normalized correlation coefficient of said first and second chaos spreading codes is equal to or less than 0.3, the communicating method comprising:

a receiving step of receiving said first and second spreading outputs;

first and second inverse spreading steps of inversely spreading said first and second spreading outputs received by said receiving unit by said first and second chaos spreading codes, respectively; and

a synchronizing step of synchronizing said first and second chaos spreading codes with a transmitting side.

Claim 19 (currently amended): The communicating ~~A~~ method of ~~according to~~ claim 18, wherein a sum of squares of amplitude values of said first and second chaos spreading codes is constant.

Claim 20 (currently amended): The communicating ~~A~~ method of ~~according to~~ claim 18, wherein

said first and second chaos spreading codes are formed by a chaos spreading code generating method comprising: ~~the steps of:~~

setting an initial value into a storing unit;

executing mapping once in which a map according to a Chebyshev's polynomial has been applied to the value that is outputted from said storing unit or divisionally executing said mapping a plurality of number of times;

randomizing a least significant bit of a mapping output; and

outputting the mapping output including said randomized least significant bit, as said chaos spreading code, and returning said output to said storing unit, and said initial value is made different between said first and second chaos spreading codes.

Claim 21 (currently amended): The ~~A code division multiple access~~ communicating method of ~~according to~~ claim 18, wherein a user is identified by said first and second chaos spreading codes.

Claim 22 (currently amended): The ~~A~~ communicating method of ~~according to~~ claim 18, wherein a reception signal of an antenna is down-converted and the down-converted signal is inversely spread.